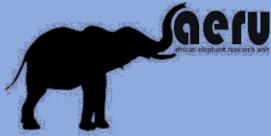


The relationship of life stage to daily social patterns of captive African elephants (*Loxodonta africana*) and the correlation of handler perceptions of elephant personality to demonstrated social behaviors

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Social interactions between herd elephants include affiliative, agonistic, and ambiguous behaviors and depend on many factors, such as maternal lineage, age, and sex. This study was designed to determine how social behaviors among a herd of captive African elephants vary throughout the day and to establish if the frequency of social interactions and age class are correlated. The study also aimed to determine if perceptions of elephant personality were an accurate predictor of social behaviors. Research took place with the African Elephant Research Unit at Knysna Elephant Park (KEP) in South Africa (Fig. 1). The herd included 7 elephants in 3 age groups: juvenile, young adult, and adult. The elephants had controlled free-roam of 200 acres on park property during the day. Continuous, all-occurrence sampling of pre-determined affiliative, agonistic, and ambiguous social behaviors was performed. Results indicate that there is a statistically higher rate of affiliative, agonistic, and total social behaviors during mid-morning than during mid-afternoon. Elephant handlers were individually surveyed regarding perceptions of each elephant's personality traits, including dominance, activity level, boldness, confidence, curiosity, sociability, and aggressiveness. This characterization was compared to the recorded elephant social behaviors, and results indicate that there is a strong positive correlation between observed agonistic rate of social behavior and rated activity levels. Results are intended to influence the management of captive elephants at KEP and elsewhere.



Figure 1: Map of South Africa & South African flag
("South Africa" available at localdemocracy.net; "Flag of South Africa" available at en.wikipedia.org.)



Figure 2: Affiliative social interaction



Figure 3: Affiliative social interaction



Figure 4: Ambiguous (play/spar) social interaction

Elephant Social Behavior and Personality

- Wild African elephants live in herds of related females & juvenile males⁷ and exhibit strong social bonds.⁵
- Known social behaviors include affiliative (friendly; Figs. 2 & 3), agonistic (hostile/dominant), and ambiguous interactions (Fig. 4).³
- Elephants have personalities, which are the characteristics that each elephant portrays, such as exploration, activity, and aggressiveness.⁴

Research Purpose

1. To determine how social behaviors among captive elephants vary throughout the day, and how this variation is related to age.
2. To determine if handler perceptions of elephant personality are an accurate predictor of social behavior.

Methods

Social Behavior Assessment

- Recorded all social interactions between elephants.
- Analyzed trends to determine differences between age group interactions throughout the day.

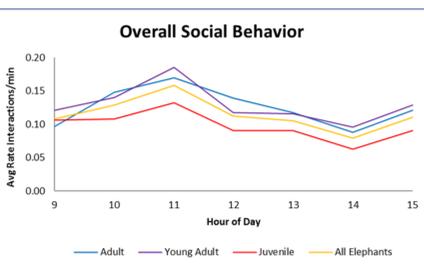
Personality Survey

- Handlers ranked elephants in comparison to each other as least to most fitting of personality traits: dominance, confidence, curiosity, activity, friendly socialization, and aggression.⁶

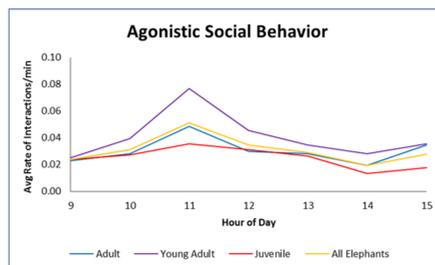
Results

Social Behavior Assessment

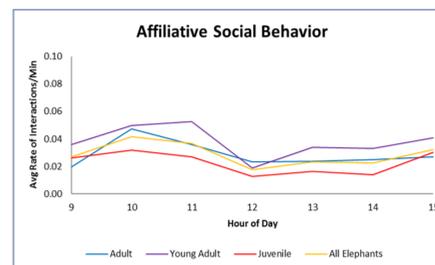
Personality Survey



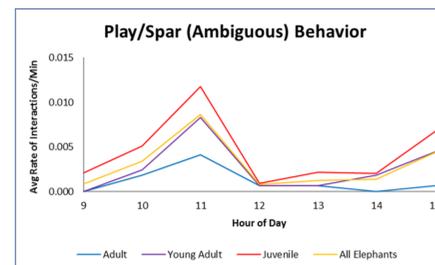
Social behavior rates peaked during mid-morning and were lowest during mid-afternoon for all age groups.



Young adults displayed the highest daily average rates of agonistic behaviors (0.041 behaviors/minute), followed by adults (0.030 beh/min), and then juveniles (0.025 beh/min).



Young adults displayed the highest daily average rates of affiliative behaviors (0.038 beh/min), followed by adults (0.029 beh/min), and then juveniles (0.023 beh/min).



Juvenile elephants displayed the highest daily average rates of play behaviors (0.004 beh/min), followed by young adults (0.003 beh/min), and then adults (0.001 beh/min).

Juvenile male total social behavior rates positively correlated with each other ($r=0.707$, $n=104$, $p<0.001$).

- Agonistic behaviors initiated correlated with perceived activity levels ($r=0.887$, $n=7$, $p=0.008$).
- Agonistic behaviors received correlated with perceived dominance ($r=0.794$, $n=7$, $p=0.033$) and perceived sociability ($r=0.826$, $n=7$, $p=0.022$).
- There was no correlation between neither affiliative nor ambiguous behaviors and any perceived personality traits.
- Perceived exploration, aggressiveness, and dominance traits positively correlated:
 - Exploration & aggressiveness ($r=0.876$, $n=7$, $p=0.010$)
 - Exploration & dominance ($r=0.806$, $n=7$, $p=0.029$)
 - Dominance & aggressiveness ($r=0.819$, $n=7$, $p=0.024$)

Conclusions

- Patterns of daily social behavior in the study herd of captive elephants reflected patterns of wild African elephants found in previous studies.^{2,9}
- As is consistent with the typical dominance hierarchy and mother-offspring relationships within a herd^{3,8}, mature elephants displayed higher rates of affiliative & agonistic behaviors than juveniles.
- Correlations between exploration, aggressiveness, and dominance personality traits indicate that further study is necessary regarding personality typing in elephants, similar to factor analysis in humans.¹

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